REMARKS

The Applicant has amended claims 1 and 4 in order to more distinctly point out and claim the invention. The Applicant has cancelled claims 10 - 20 for convenience without prejudice and without intent to narrow or otherwise limit the literal or equivalent scope of any claim herein. The rejection of claims 10 - 20 is therefore moot. The Applicant has added new claims 21 - 25 for consideration.

The Applicant respectfully submits that claims 1-9 and 21 - 25 are allowable over Fu (US 2002/0146879 A1), Gardner et al. (US 6,323,519 B1), and Wolf (ISBN: 0-961672-4-5) when viewed in combination under 35 USC §103(a).

Fu is directed towards limiting hydrogen ion diffusion using multiple layers of SiO2 and Si3N4 in a spacer structure. Fu discloses three embodiments of the spacer structure. All three of these embodiments include the formation of a layer of nitrided-oxide between the oxide layer and the silicon nitride layer. Fu's first embodiment [paragraphs 62-64] discloses the use of a nitrogen ion or neutral species to form an SiO_xN_y layer. A silicon nitride layer is then formed over the SiO_xN_y layer. Fu's second embodiment [paragraphs 65-66] forms a thin silicon nitride layer over the silicon oxide layer. This thin silicon nitride layer is formed using ammonia, which nitridizes some of the oxide layer producing a layer of nitrided-oxide. Fu's third embodiment [paragraph 67-68] uses ALD to form the silicon nitride barrier layer. Fu discloses that the nitrogen containing gas may be ammonia, which nitridizes the oxide. Further, Fu discloses that a portion of the nitrogen-contained gas is chemically absorbed on the silicon oxide surface, which thereby forms nitrided-oxide.

Similarly, Gardner teaches a dielectric spacer structure that utilizes nitrided-oxide (see abstract lines 7-20). Gardner's patent teaches that the use of nitrided-oxide in spacers is needed in order to address the problem of boron diffusion and diffusion other impurities from the substrate (co. 4 lines 57-59). The Examiner states in the office action in the last paragraph starting on page 3 that Gardner teaches "a gate structure with a silicon oxide layer underneath a silicon nitride layer 24 that is substantially free of nitrogen." The Applicant wishes to respectfully point out to the Examiner that layer 24 in Gardner is not a silicon nitride layer, but is in fact a nitrided-oxide layer 24 (see col. 8 line 57). The portions of the Gardner specification cited by the Examiner (col. 4 lines 15-28, Fig 12 column 10 lines 9-30), when taken in full context, reveal that every embodiment of the spacer taught by Gardner includes nitrided-oxide. Gardner teaches that horizontal portions of the nitrided-oxide layers 24 and 56 may be removed (col. 4 lines 1-4, col. 8 lines 57-58, and col. 11 lines 4-7) in order to form ultra thin nitrided-oxide side wall spacers 26 and 58. The spacers 26 and 58 that remain in the final embodiment are nitrided-oxide (col. 9 lines 5-8 and col. 11 lines 4-9). Further, "in the embodiment of FIG. 10, all of oxide 34 is converted to nitrided-oxide..." (col. 9 lines 60-65).

For *modern deep submicron* device fabrication processes the thermal budget is so small that the hydrogen ion diffusion and boron diffusion addressed by Fu and Gardner is not the primary problem. The primary problem is the nitrided-oxide layer that is formed between the layer of oxide and the layer of silicon nitride. This nitrided-oxide layer is a source of stress within the spacer structure. This stress caused by the nitrided-oxide layer results in the deactivation of acceptors or donors in the source/drain regions by means of a clustering mechanism. As a consequence of this stress of the nitrided-oxide, the device performance of the

MOSFET deteriorates due to Short Channel Effects and junction leakage. [see inter alia, Applicant's disclosure page 9 line 17 - page 10 line 8]. Applicant's claims are directed toward a method of producing a spacer that does not have this layer of nitrided-oxide between the oxide and the silicon nitride layer in order to address this stress problem. Since the Applicant's claims are directed to a different structure that performs a different function, the Applicant respectfully submits that claims 1-9 and 21-25 are allowable over Fu, Gardner, and Wolf when viewed in combination under 35 USC §103(a).

CONCLUSION

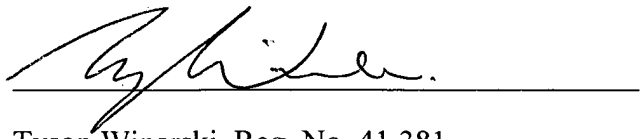
The Applicant respectfully submits that the present application is now placed in a condition for allowance and requests the issuance of a notice of allowance.

Please note that any amendments to the claims which have been made in this amendment, that have not been specifically noted to overcome a rejection based upon the prior art should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

The Commissioner is hereby authorized to charge/credit any fee deficiencies/overpayments to Deposit Account No. 502365

If the Examiner believes that a telephone conference would be of value, she is invited to contact the Applicant's Representative, Tyson Winarski, in regards to this paper at (602) 257-5298.

Respectfully Submitted,



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